

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

1. (currently amended): A magneto-resistance device comprising:  
  
an anti-ferromagnetic layer;  
  
a pinned ferromagnetic layer having a fixed spontaneous magnetization and coupled with  
said anti-ferromagnetic layer ~~such that a direction of spontaneous magnetization of said pinned~~  
~~ferromagnetic layer is fixed~~;  
  
a non-magnetic tunnel insulating layer coupled with said pinned ferromagnetic layer; and  
  
a free ferromagnetic layer coupled with said tunnel insulating layer and having a  
reversible free spontaneous magnetization,  
  
wherein said pinned ferromagnetic layer comprises a first composite magnetic layer  
configured to prevent at least one of elements of said anti-ferromagnetic layer from diffusing into  
said tunnel insulating layer.
2. (Original) The magneto-resistance device according to claim 1, wherein said anti-ferromagnetic layer contains Mn, and  
  
said first composite magnetic layer prevents said Mn from diffusing into said  
tunnel insulating film.
3. (currently amended): The magneto-resistance device according to claim 1 [or 2],  
wherein said first composite magnetic layer comprises:

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ferromagnetic material that has been not oxidized; and  
oxide of a material which is easy to combine with oxygen compared with said  
ferromagnetic material.

4. (Original) The magneto-resistance device according to claim 3, wherein said  
ferromagnetic material contains Co in as a main component.

5. (currently amended): The magneto-resistance device according to claim 1 ~~any of  
claims 1 to 4~~, wherein said first composite magnetic layer is formed from a region of an  
amorphous phase as a whole or from a region of said amorphous phase and a region of a  
crystalline phase.

6. (Original) The magneto-resistance device according to claim 5, wherein said  
crystalline phase region contains a plurality of crystal regions, and

said plurality of crystal regions pass through said first composite magnetic layer into a  
direction of a thickness of said first composite magnetic layer.

7. (currently amended): The magneto-resistance device according to claim 5 [or 6],  
wherein a composition of said amorphous phase in said first composite magnetic layer is  $D_ZM_1$   
 $_Z O_X$  ( $0.6 \leq Z \leq 0.9$ , and  $X > 0$ ),

said D is at least one selected from the group consisting of Co, Fe and Ni, and

said M is at least one selected from the group consisting of Ta, Zr, Hf, Nb, and Ce.

8. (currently amended): The magneto-resistance device according to claim 1 ~~any of  
claims 1 to 4~~, wherein said first composite magnetic layer contains a plurality of crystal grains  
comprising [said] ferromagnetic material,

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said plurality of crystal grains are separated from each other by [said] oxide, and  
a part of said plurality of crystal grains contacts an adjacent one of said plurality of  
crystal grains.

9. (Original) The magneto-resistance device according to claim 8, wherein said oxide  
comprises oxide of at least an element selected from the group consisting of Al, Si, Mg and Ti.

10. (currently amended): The magneto-resistance device according to claim 1 ~~any of  
claims 1 to 4~~, wherein said first composite magnetic layer contains a plurality of crystal grains  
comprising [said] ferromagnetic material, and

said plurality of crystal grains are separated from each other by [said] oxide and pass  
through said first composite magnetic layer into a direction of a thickness of said first composite  
magnetic layer.

11. (Original) The magneto-resistance device according to claim 10, wherein a part of  
said plurality of crystal grains contacts an adjacent one of said plurality of crystal grains.

12. (currently amended): The magneto-resistance device according to claim 10 [or 11],  
wherein said oxide comprises oxide of at least an element selected from the group consisting of  
Al, Si, Mg, Ti, Ta, Hf, Zr, Nb and Ce.

13. (currently amended): The magneto-resistance device according to claim 8 ~~any of  
claims 8 to 12~~, wherein a thickness of said oxide is thinner than a grain diameter of each of said  
plurality of crystal grains.

14. (Original) The magneto-resistance device according to claim 13, wherein the  
thickness of said oxide is equal to or less than 2 nm.

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15. (Original) The magneto-resistance device according to claim 14, wherein an average grain diameter of said plurality of crystal grains is equal to or less than 10 nm.

16. (currently amended): The magneto-resistance device according to claim 8 ~~any of claims 8 to 15~~, wherein ferromagnetic coupling is kept between said plurality of crystal grains.

17. (currently amended): The magneto-resistance device according to claim 1 ~~any of claims 1 to 16~~, wherein said pinned ferromagnetic layer further comprises a first metal ferromagnetic layer and a second metal ferromagnetic layer, and

said first composite magnetic layer is interposed between said first metal ferromagnetic layer and said second metal ferromagnetic layer.

18. (currently amended): The magneto-resistance device according to claim 1 ~~any of claims 1 to 17~~, wherein a resistivity of said first composite magnetic layer is in a range of 10  $\mu\Omega\text{cm}$  to 3000  $\mu\Omega\text{cm}$ .

19. (currently amended): The magneto-resistance device according to claim 1 ~~any of claims 1 to 18~~, wherein said free ferromagnetic layer comprises:

a second composite magnetic layer configured to prevent at least one elements of said free ferromagnetic layer from diffusing into said tunnel insulating layer.

20. (Original) The magneto-resistance device according to claim 19, wherein said free ferromagnetic layer contains Ni, and

said second composite magnetic layer prevents said Ni from diffusing into said tunnel insulating film.

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21. (currently amended): The magneto-resistance device according to claim 20, wherein said free ferromagnetic layer comprises:

a metal ferromagnetic layer, ~~one of whose boundaries is connected to~~ provided between said tunnel insulating layer and ~~the other of whose boundaries is connected to~~ said second composite magnetic layer; and

a soft magnetic layer containing said Ni and connected to ~~a boundary of~~ said second composite magnetic layer ~~which is on~~ an opposite side to said metal ferromagnetic layer.

22. (currently amended): The magneto-resistance device according to claim 1 [or 2], wherein said pinned ferromagnetic layer comprises:

a non-magnetic layer; and

two ferromagnetic layers anti-ferromagnetically coupled to each other through said non-magnetic layer.

23. (currently amended): The magneto-resistance device according to claim 19 [or 20], wherein said free ferromagnetic layer comprises:

a non-magnetic layer; and

two ferromagnetic layers anti-ferromagnetically coupled through said non-magnetic layer.

24. (currently amended): A magnetic memory comprising[:]

[said] a magneto-resistance device according to any of claims 1 to 23 which comprises:  
an anti-ferromagnetic layer;

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a pinned ferromagnetic layer having a fixed spontaneous magnetization and coupled with said anti-ferromagnetic layer;

a non-magnetic tunnel insulating layer coupled with said pinned ferromagnetic layer; and  
a free ferromagnetic layer coupled with said tunnel insulating layer and having a reversible free spontaneous magnetization,

wherein said pinned ferromagnetic layer comprises a first composite magnetic layer configured to prevent at least one of elements of said anti-ferromagnetic layer from diffusing into said tunnel insulating layer.

25. (Cancelled)

26. (Cancelled)

27. (Cancelled)

28. (new): The magnetic memory according to claim 24, wherein said free ferromagnetic layer comprises:

a second composite magnetic layer configured to prevent at least one elements of said free ferromagnetic layer from diffusing into said tunnel insulating layer.

29. (new): A magneto-resistance device comprising:

an anti-ferromagnetic layer;

a pinned ferromagnetic layer having a fixed spontaneous magnetization and coupled with said anti-ferromagnetic layer;

an intermediate layer coupled with said pinned ferromagnetic layer; and

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a free ferromagnetic layer coupled with said intermediate layer and having a reversible free spontaneous magnetization,

wherein at least one of said pinned ferromagnetic layer and said free ferromagnetic layer comprises a first composite magnetic layer configured to prevent at least one of elements of a corresponding one of said anti-ferromagnetic layer and said free ferromagnetic layer from diffusing into said intermediate layer.